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DIOPHANTINE ANALYSIS.

124. Proposed by **F. P. MATZ, Sc. D., Ph. D.,** Reading, Pa.

Find (1) three square numbers whose sum is a cube; (2) three cube numbers whose sum is a square.

I. Remark by **J. SCHEFFER,** Hagerstown, Md.

(1) The sum of the three squares 9, 16, 100 gives the cube number 125, hence $9n^6+16n^6+100n^6=125n^6=(5n^2)^3$, where n=any integer. There are doubtless other sets of numbers satisfying this condition.

(2) Since the sum of the cubes of three Pythagorean numbers is a square, one set of numbers satisfying this condition is: $27\times6^{6n-3}$, $64\times6^{6n-3}$, $125\times6^{6n-3}$, whose sum$=6^{6n}$.

II. Remark by the **PROPOSER.**

(1) Since $5^2+6^2+8^2=5^3$, the numbers $5n$, $6n$, $8n$, n=integer, satisfy the required condition.

(2) Since $1^3+2^3+3^3=6^2$ the numbers n^3, $8n^3$, $27n^3$, n=integer, satisfy the required condition.

Also solved by G. B. M. Zerr, and A. H. Holmes.

125. Proposed by **F. P. MATZ, Sc. D., Ph. D.,** Reading, Pa.

What *values* of x will make $E=\dfrac{(x+7)\,(x+5)}{(x-7)\,(x-5)}$ represent square numbers?

Solution by **G. B. M. ZERR.**

$$E=\frac{(x+7)\,(x+5)}{(x-7)\,(x-5)}=\frac{(1+7/x)(1+5/x)}{(1-7/x)(1-5/x)}.$$

Hence, two values of x which satisfy the required condition are 0, ∞.

Also solved by J. Scheffer, and the Proposer.

AVERAGE AND PROBABILITY.

158. Proposed by **F. P. MATZ. Sc. D., Ph. D.,** Reading, Pa.

In a given square an arc is described at random the center being one of the vertices of the square. What is the probability that this arc is longer than a side of the square?

Solution by **B. F. FINKEL, A. M.,** Professor of Mathematics and Physics, Drury College, Springfield, Mo.

Let $ABCD$ be the square; A the vertex from which the random arc is drawn; and EIF and HKG arcs whose lengths are equal to a, the length of a side of the square. Then if the random arc falls between the arcs EIF and HKG its length will exceed the length of a side of the square.